ABSTRACT OF THE DISCLOSURE

Spectral optical imaging at one or more key water absorption fingerprint wavelengths measures the difference in water content between a region of cancerous or precancerous tissue and a region of normal tissue. Water content is an important diagnostic parameter because cancerous and precanerous tissues have different water content than normal tissues. Key water absorption wavelengths include at least one of 980 nanometers (nm), 1195 nm, 1456 nm, 1944 nm, 2880 nm to 3360 nm, and 4720 nm. In the range of 400 nm to 6000 nm, one or more points of negligible water absorption are used as reference points for a comparison with one or more key neighboring water absorption wavelengths. Different images are generated using at least two wavelengths, including a water absorption wavelength and a negligible water absorption wavelength, to yield diagnostic information relevant for classifying a tissue region as cancerous, precancerous, or normal. The results of this comparison can be used to identify regions of cancerous tissue in organs such as the breast, cervix and prostate.